

# Kentucky Pollutant Discharge Elimination System (KPDES)

## Socioeconomic Demonstration and Alternatives Analysis

The Antidegradation Implementation Procedure found in 401 KAR 10:030, Section 1(3)(b)3 requires KPDES permit applications for new or expanded discharges to waters categorized as "Exceptional or High Quality Waters" to conduct a socioeconomic demonstration and alternatives analysis to justify the necessity of lowering local water quality to accommodate important economic or social development in the area in which the water is located. This demonstration shall include this completed form and copies of any engineering reports, economic feasibility studies, or other supporting documentation

### I. Project Information

Facility Name: Louden Mine (DMRE Permit #918-0400)

KYGO46402

Location: 1.3 miles south of Louden and 0.1 mile south of Louden Road's junction with Mays Cemetery Road

County: Whitley

Receiving Waters Impacted: Mulberry Creek a tributary to the Cumberland River & the Cumberland River

### II. Socioeconomic Demonstration

#### 1. Define the boundaries of the affected community:

(Specify the geographic region the proposed project is expected to affect. Include name all cities, towns, and counties. This geographic region must include the proposed receiving water.)

The proposed project is located in Whitley County approximately 0.1 mile south of Louden Road's junction with Mays Cemetery Road and located 0.1 mile west of the Cumberland River at the latitude of 36° 44' 16" and longitude 84° 02' 10" on the Saxton, KY U.S.G.S. 7½ minute quadrangle map. The surface area of the project is 24.9 acres. The nearest community is Louden which is located approximately 1.3 miles north of the proposed project. The Cumberland River and Mulberry Creek are the receiving streams for the proposed discharges.

#### 2. The effect on employment in the affected community:

(Compare current unemployment rates in the affected community to current state and national unemployment rates. Discuss how the proposed project will positively or negatively impact those rates, including quantifying the number of jobs created and/or continued and the quality of those jobs.)

The current unemployment rate in Whitley County is 12.1%. The statewide rate is 11% and the national rate stands at 9.4%. The change in Whitley County's unemployment rate has increased 4.3% from July 2008 – July 2009. The increase is comparative to a statewide increase of 4.4% and a national increase of 4.0%. Recent trends reflect a decrease in unemployment in Kentucky compared to an increase nationally. Whitley County reflects a decrease of 0.5% compared to a statewide decrease of 0.1% and a national increase of 0.4%; from June 2009 – July 2009. All rates are sourced from the Kentucky Office of Employment and Training, Research and Statistics Branch; referenced from July seasonally adjusted data.

The proposed project will positively impact the unemployment rates stated. Approximately 35 workers will remain employed exclusive from 56 indirect workers who will remain employed. The average weekly wage for mining employees in Whitley County is \$792.00 (U.S. Department of Labor, Bureau of Labor Statistics).

## **II. Socioeconomic Demonstration- continued**

### **3. The effect on median household income levels in the affected community:**

(Compare current median household income levels with projected median household income levels. Discuss how proposed project will positively or negatively impact the median household income in the affected community including the number of households expected to be impacted within the affected community.)

The median household income for Whitley County is (as of 2008) \$27,548 per annum. Based on U.S. Department of Labor, Bureau of Labor Statistics, the average weekly income for each of the 35 mine workers to be employed is \$792 and the average weekly wage for other workers in the county is \$532. Thus the total income would bring an annual increase of \$1,441,440 in purchasing power for Whitley County and surrounding areas.

Generally, Whitley County as a whole would be positively impacted by the increase in revenues that this proposed project would bring about. Employees would have a more secure place of employment and higher than average income. The families in these 35 households will be economically sustained. Their purchasing power would have a trickle effect in reversing the unemployment trend for other workers in the region of the proposed project.

### **4. The effect on tax revenues of the affected community:**

(Compare current tax revenues of the affected community with the projected increase in tax revenues generated by the proposed project. Discuss the positive and negative social and economic impacts on the affected community by the projected increase.)

Whitley County permits local taxation on real estate, finished goods and other tangible properties. The taxes are levied at the following rates per \$100.00: \$0.1220 for real estate, \$0.1809 for motor vehicles and \$0.3647 for other tangible property. The proposed project will utilize the use of this selected class of property and this will be additional money for government services to better serve the citizens. Schools will benefit because the increased property taxes would ensure better equipment, facilities and better pay for teachers.

In Whitley County, coal severance tax breaks down as follows: For an average of \$8,020,251 gross value of severed coal, there is a tax of about \$489,445 and for an average of \$1,530,808 gross value of processing there is a total tax receipt of \$509,081. Approximately 38,500 tons of coal will be recovered from this proposed project. The gross value of severed coal (at \$92.00 per ton) would be \$3,542,000. Kentucky imposes a coal severance tax of 4.5% on the gross value of severed coal; thus, the tax on severed coal would be \$159,390. Approximately 15% of this amount would be allocated to Whitley County's tax base. This will further provide more capital for more development projects to serve to improve livelihood in the county.

## **II. Socioeconomic Demonstration- continued**

### **5. The effect on an existing environmental or public health in affected community:**

(Discuss how the proposed project will have a positive or negative impact on an existing environmental or public health.)

This proposed project area has been previously mined and timbered and left abandoned with no reclamation. The area will be reclaimed following the conclusion of mining. This will provide an enhanced habitat and environment. During reclamation, all permitted areas will be stabilized to prevent erosion. Species indigenous to the area will be planted to establish adequate vegetation and runoff from all re-graded areas will be diverted into sediment ponds to prevent sedimentation to nearby streams. Following reclamation, the permit area will be in better condition than existed prior to mining. This will provide a healthier habitat for aquatic species and wildlife leading to a more balanced ecosystem. Additionally, recovery of the coal will increase severance tax revenues, which will be returned to the community. The money can be used for environmental protection such as sewage disposal, sanitation and solid waste disposal, which will have beneficial effects on the existing environment.

### **6. Discuss any other economic or social benefit to the affected community:**

(Discuss any positive or negative impact on the economy of the affected community including direct and or indirect benefits that could occur as a result of the project. Discuss any positive or negative impact on the social benefits to the community including direct and indirect benefits that could occur as a result of the project.)

This project will require other supporting jobs, as well as mining jobs. Equipment sales and repair, mining/engineering consultants and fuel/transportation providers will be needed as a result of this project. The continuation of these jobs and the taxes collected because of it, will spur community development by the creation of more jobs in Whitley County and other surrounding communities i.e. Knox, Laurel and McCreary. It will also provide additional revenue to the businesses of the area which are already in existence. There is the potential of 35 direct jobs and 56 indirect jobs created as a result. The increased payment of property taxes will be for the improvement of the county. The additional mining should increase coal severance tax and this would subsequently increase the tax base for Whitley County.

After Mining is completed, the area will be utilized for outdoor recreation activities. Reclamation has the potential of enhancing the habitat of the local flora and fauna, thus increasing Whitley County's allure as a nature tourism hub.

### **III. Alternative Analysis**

#### **1. Pollution prevention measures:**

(Discuss the pollution prevention measures evaluated including the feasibility of those measures and the cost. Measures to be addressed include but are not limited to changes in processes, source reductions or substitution with less toxic substances. Indicate which measures are to be implemented.)

The pollution prevention measures to be implemented for this proposed project include keeping gradients and inclines to the active pit as short as possible in order to minimize the amount of drainage going to the active surface mining site, constructing on-site diversions to convey water around disturbed areas, constructing by pass diversions to collect or divert water to a receiving stream; that would otherwise flow through the disturbed area.

Other measures would include covering or treating potential contamination producing materials so as to minimize adverse effects on water quality, minimizing the disturbed surface area that is open at one time and implementing sedimentation controls, routing and segregation or combination of wastewater and mine runoff water to minimize the effect on the quality of the receiving stream i.e. Mulberry Creek and the Cumberland River.

#### **2. The use of best management practices to minimize impacts:**

(Discuss the consideration and use of best management practices that will assist in minimizing impacts to water quality from the proposed permitted activity.)

The proposed project would implement the recommended BEST Management Practices for mining operations in Kentucky. The water and sediment control strategies would be preplanned. The sediment ponds would be sized to accommodate a 25 year/24 hour storm event. The ponds will be placed on bench and in upland areas not in sites with steep topography, in stream or a buffer area.

Existing vegetation would be retained where feasible. Approximately 100' naturally vegetated buffer would be provided adjacent to any streams, ditches or drainage courses consisting of trees, shrubs and grasses or other herbaceous species to protect surface water from soil runoff and mining contaminants.

BMP structures would be inspected within 24 hours of each significant rainfall event and corrective actions taken immediately, if erosion or soil runoff is observed. The runoff will be diverted away from disturbed areas to prevent any adverse effect on water quality as a result of increased in turbidity or total suspended solids. All denuded areas which are not actively being mined would be vegetated and mulched. Local materials and native plant species would be selected for reclamation.

Any work which results, in exposed earth on slopes leading to wetlands or surface water during periods when significant rainfall is not predicted, all sediment should be trapped on site. The length and steepness of the slopes on site would be minimized, the runoff velocity would be minimized and buffer or filter strips would be left between land disturbances and natural waterways.

**3. Recycle or reuse of wastewater, waste by-products, or production materials and fluids:**

(Discuss the potential recycle or reuse opportunities evaluated including the feasibility of implementation and the costs. Indicate which of, of these opportunities are to be implemented)

In Whitley County, the mean number of days of precipitation (0.01 inches or more) (30-year record) is 127.6. Using the standard 1 inch of rain over 1 acre of land being equal to 27,154 gallons of water, this proposed project (which covers an expanse of approximately 24.9 acres) would receive at least 6,734 gallons per precipitation of 0.01 inches. At least 859,258 gallons of precipitation would be received per annum.

Water is an integral aspect in mining operations as far as misting/spraying the area to help alleviate airborne dust. Nonetheless, the amount of water required for dust suppression is minimal compared to the amount of precipitation and discharge generated. Water used for dust suppression is generally only required during dry times when the flow of the surface discharge is low or non-existent. Approximately 15,000 gallons of water would be needed for dust suppression per day. Storm water captured in the sediment ponds can be used for refilling water trucks, which would be used for dust suppression activities. No other water is needed for recycling or reuse with this operation.

A small portion (40,000 gallons) of the total discharge generated will be used for hydro-seeding when grade work is completed on the project. This will require 20 loads (2000 gallons per load), with a cost of \$18,000 (\$900/load).

Construction of a lake for recreational purposes was also evaluated as a possible alternative. This would involve acquisition of land, environmental and engineering surveys and construction of a dam, at the very least. The estimated cost of this alternative is approximately \$40,000,000.

### III. Alternative Analysis - continued

#### 4. Application of water conservation methods:

(Discuss the potential water conservation opportunities evaluated including the feasibility of implementation and the costs. Indicate which of, of these opportunities are to be implemented)

Effective implementation of some aspects of the use of best management practices to minimize impacts (as stated previously) would be effective and instrumental in ensuring water conservation. The effective sizing of the sediment ponds to accommodate a 25 year/24 hour rainfall event would ensure that waste water which overflows is stored. Ponds will be situated at locations which have the requisite gradient to ensure that they function at their optimum. Runoff would be diverted from disturbed areas to ensure that waste water is relatively less contaminated and approximately 100 feet buffer would be provided adjacent to ditches and drains too.

Other options are available to conserve waste water quality. They include using reverse osmosis filtration systems, a system of thickeners and vacuum cleaners among others. These alternative options are not practical because they require extra costs, additional site disturbance, power lines and increased operating costs. The average cost for a reverse osmosis plant capable of handling 5000 gallons of water is \$2.9 million dollars. This cost is not practical for this proposed project.

#### 5 Alternative or enhanced treatment technology:

(Compare feasibility and costs of proposed treatment with the feasibility and costs of alternative or enhanced treatment technologies that may result in more complete pollutant removal. Describe each candidate technology including the efficiency and reliability in pollutant removal and the capital and operational costs to implement those candidate technologies. Justify the selection of the proposed treatment technology.)

Several alternatives to treating water from the project area and discharging it to streams and rivers in the area have been evaluated. These alternatives include construction of a water treatment facility, construction of filter barriers, chemical treatment of drainage and construction of wetlands.

**Water treatment Facility:** Construction of a small water treatment facility (500,000 gallons per day) on the project site would cost over \$1.6 million dollars plus an additional cost of approximately \$50,000 for a containment reservoir. Because of the high cost of construction, the short life of the proposed operation (only five years) and the large amount of water to be treated [859,258 gallons mean number days of precipitation (0.01 inches or more) (30-year record)]. It would require several of these small facilities or one large facility (over \$291,000) to handle this amount.

**Physical Filter Barriers:** Silt fences and straw bales would not be able to handle the large discharge flow generated nor would they meet the requirements of the Commonwealth of Kentucky's Surface mine Regulations as stated in 405 KAR 16:070.

**Chemical Treatment:** Chemical treatment of drainage was also considered. The primary treatment required at this site is the removal of sediments, which would require the use of ponds or dugouts to hold the water while the soil and debris settle out. Chemicals may be used to augment this process, but sediment removal is not possible using chemical treatment alone. It would not be cost efficient to treat the entire column of discharge at this site.

**Wetland Construction:** Constructed wetlands have traditionally been used for biological treatment. However, the discharge generated by this operation will require sedimentation control measured and wetlands are not effective for treating sediment. Additionally, wetlands used for water treatment would require additional property (approximately 1 acre), which is not available in this particular project area. It would cost approximately \$25,716 to construct these wetlands.

### **III. Alternative Analysis - continued**

#### **6. Improved operation and maintenance of existing treatment systems:**

(Discuss improvements in the operation and maintenance of any available existing treatment system that could accept the wastewater. Compare the feasibility and costs of improving an existing system with the feasibility and cost of the proposed treatment system.)

The storm water will be maintained in a dugout structure prior to discharge. This will allow settling to occur so that lowering of water quality will be minimized based on applicable regulations concerning discharges from the project site. It is not feasible to store the water on-site, dispose of it below the surface or construct a treatment facility for a short term project. Accepting lower water quality standards would create additional burden and cost to this project. In order to lower the standards larger ponds would have to be built. For the embankment ponds this means more disturbances in the streams, larger volumes of water stored behind the embankments and higher construction/removal costs (approximately \$15,000 per pond). Avoiding this project is not a viable option as the advantages to the economic development of Whitley County would not be realized. Jobs would be lost, the tax base would diminish and local business would not prosper. Based on U.S. Department of Labor, Bureau of Labor Statistics, the average weekly wage of all industries in the U.S. is \$782.00 per week. While in Whitley County the average weekly wage is \$532.00, only 68% of the national average. The average weekly wage for mining employees in Whitley County is \$792.00 and is the highest paying industry in the local area. Therefore, if this project does not materialize the loss of 35 direct jobs and 56 indirect jobs would drive the economy down by \$72,072 per week or \$3,747,744 per year.

#### **7. Seasonal or controlled discharge options:**

(Discuss the potential of retaining generated wastewaters for controlled releases under optimal conditions, i.e. during periods when the receiving water has greater assimilative capacity. Compare the feasibility and cost of such a management technique with the feasibility and cost of the proposed treatment system.)

This project proposes to construct sediment ponds to ensure controlled release of generated wastewater under optimal conditions. The capacity of the physical, chemical and biological processes to assimilate is interconnected and based on the features of the streamscape (the stream, flood plain and riparian zone). Even though the removal of natural features i.e. vegetative cover may compromise the abilities of Stream Assimilative Processes, construction of the sediment ponds mitigate the impact. The ponds retard the velocity of the storm water thus enhancing sediment filtering and reducing its deposition. The settling ponds would be sized to accommodate a 25 year/24 hour storm event and ponds will be placed on bench and in upland areas instead of in steep topography or buffer areas.

### III. Alternative Analysis - continued

#### 8 Land application or infiltration or disposal via an Underground Injection Control Well

(Discuss the potential of utilizing a spray field or an Underground Injection Control Well for shallow or deep well disposal. Compare the feasibility and costs of such treatment techniques with the feasibility and costs of proposed treatment system.)

Onsite and subsurface disposal options are not feasible alternatives. The installation of a sanitary septic system, (i.e. septic tank) was evaluated but is not an applicable option. Building a system large enough to handle the volume of water would be impractical. The typical septic tank will only hold 1,000 gallons. This project could produce up to 26,643 gallons per minute during peak discharge for a 10yr/24 hr storm event. With this anticipation, it would require well over 27 septic systems with drain fields up to an acre for each event. This site will not have adequate useable space that this number of systems could be placed. Septic systems are designed to digest organic waste and biodegradable material over time by anaerobic digestion. While the source water would most likely contribute some organic material and some needed bacteria, this would be inadequate to decompose the sediment and would work essentially the same as a sediment structure. Also, the possibility of drilling an injection well (to inject the discharges underground) depending on depth could cost up to \$50,000 per well. Injecting this discharge underground would increase the potential of an outcrop blowout from an old unknown adit and would require a UIC permit. A suitable place to inject, within 0.5 miles of this project has not been located. In addition to potential safety impacts associated with the subsurface disposal, this alternative would reduce the quantity of water available to support downstream aquatic communities. There are no known underlying abandoned underground works in the area to receive such discharges if this was a viable option.


#### 9 Discharge to other treatment systems

(Discuss the availability of either public or private treatments systems with sufficient hydrologic capacity and sophistication to treat the wastewaters generated by this project. Compare the feasibility and costs of such options with the feasibility and costs of the proposed treatment system.)

It would take approximately \$5.03 million (75,122 feet of 24" HDPE pipe at \$67/ft.) to run 24" HDPE pipe to the nearest downstream municipal water treatment plant, which is the Williamsburg Waste Water Treatment Plant in Williamsburg, Kentucky. The Williamsburg treatment plant would then require a sedimentation basin to remove the silt before allowing the water to enter the plant.

Trucking would need to be available for the potential 10yr/24hr storm event. The run-off from the mine site was determined by a SEDCAD 4 watershed analysis to be 4.89 acre-feet. This equates to 1,593,413 gallons of waste water in the 24 hour storm event. Assuming the use of 6000 gallon capacity tanker trucks for hauling, the trucking of this volume of water would require 266 tanker truck loads to remove this volume of water in a 24 hour period. It is estimated that the time to pump into the tanker, round trip haul and unloading time at the waste water plant is at a minimum of 4 hours. It would require 45 trucks with a capacity of 6,000 gallons each working 24 hours a day, to haul the discharge to the treatment plant. The trucks would cost approximately \$10.35 million (\$230,000 per truck), and the maintenance and diesel would cost over \$33,750 per day (\$12,318,750 for year) for an annual cost of \$22,668,750.

**IV Certification:** I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name and Title:	Keith Smith, President	Telephone No.:	(606)523-9760
Signature:		Date:	September 29, 2009

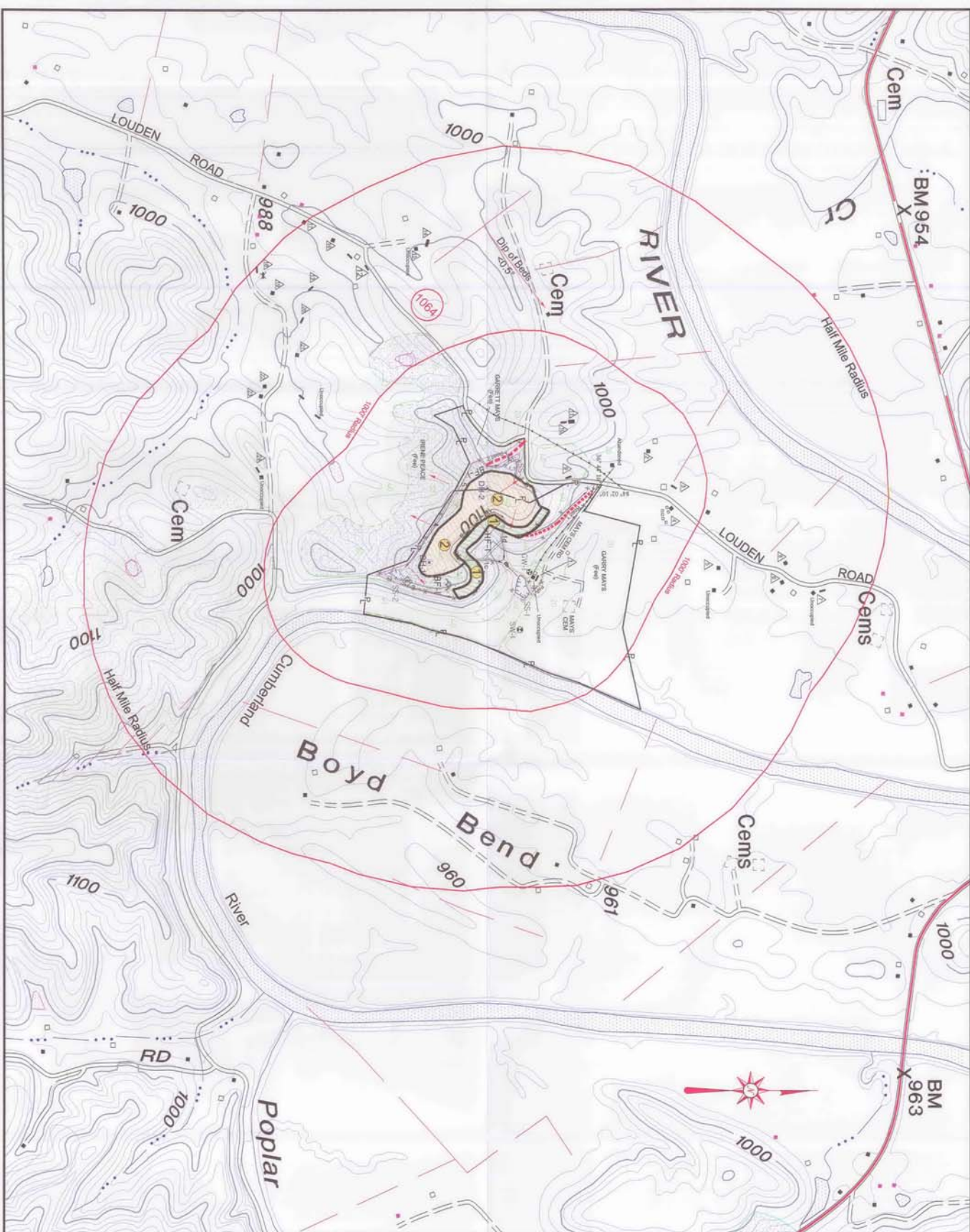


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Wavelength	Application No.
30° 44° 10°	918-0400 NW
MAP SCALE	1"=400'
CONTOUR INTERVAL	20'

THE PROPOSED OPERATION IS APPROXIMATELY 1.1 MILES SOUTH OF THE COMMUNITY OF LOUDEN AND 0.3 MILES SOUTH OF LOUDEN RD'S JUNCTION WITH BAYS CREEK RD.



Date \_\_\_\_\_ Reg. # \_\_\_\_\_  
I hereby certify in accordance  
with KAS 7-040, section 10, that this document is  
correct as determined by accepted engineering  
practices and includes all information required of it by  
KAS Chapter 350 and KAS Title 405.

DATE: 5/6/2003

WSP DATE: 5/07/2007